



UTAH OFFICE OF
ENERGY DEVELOPMENT

From There to Here - How Energy Moves and Changes

Grade/Subject: Physics

Strand/Standard PHYS.2.3 Develop and use models on the macroscopic scale to illustrate that energy can be accounted for as a combination of energies associated with the motion of objects and energy associated with the relative positions of objects. Emphasize relationships between components of the model to show that energy is conserved. Examples could include mechanical systems where kinetic energy is transformed to potential energy or vice versa. (PS3.A)

Lesson Performance Expectations:

- Students will describe how energy changes from one form to another.
- Students will model where all energy goes and explain that no energy is lost.

Materials: A group of 4 needs

- 1- Set of Energy Cards
- 1- Small poster (or an 11 x 16 sheet of paper).
- Colored pencils or access to a computer and printer.

Time: 60 minutes/1 period

Teacher Background Information:

- [The Ten Types of Energy](#)
- [EIA Energy Sources and Statistics](#)

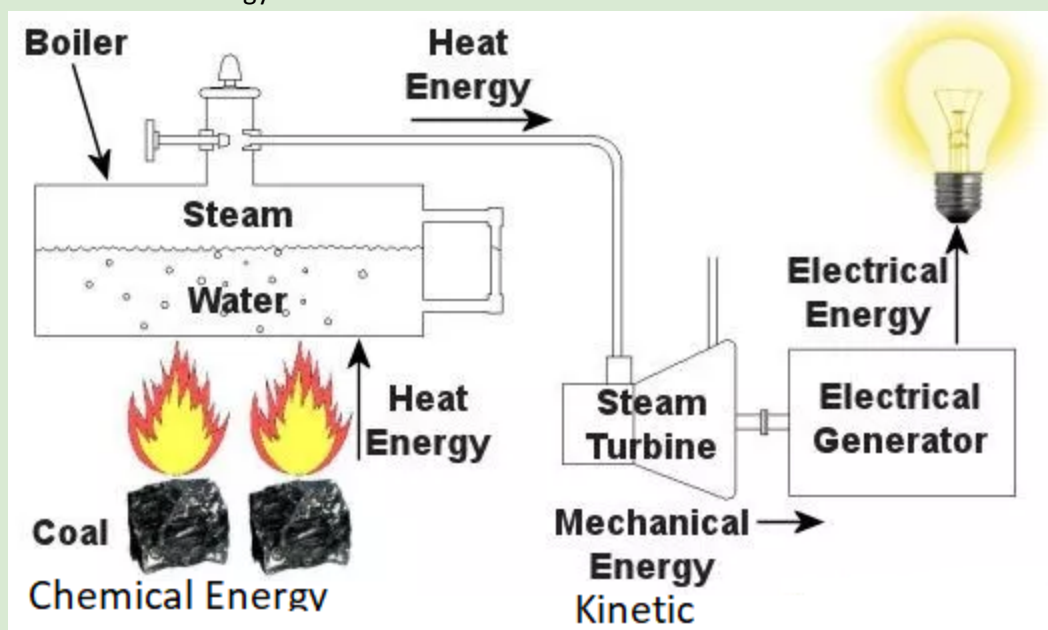
Student Background Knowledge:

- Students should have a basic idea of what 'energy' is and that we transfer it from sources to the places where it can be used.

Teacher Step by Step: A 3-d lesson should insist students do the thinking. Provide time and space for the students to experience the phenomenon and ask questions. The student sheet provided below provides guidance but is only an example of how students might respond.

1. Introduce Phenomenon: Watch the video about people living in a very rural country with no electricity. Think about what your life would look like without access to electricity. Write down questions about why they don't have electricity in their village. What are the ways that electricity gets to us/what is required? Life Without Electricity <https://www.youtube.com/watch?v=DSCiPFoCAX8> (5:45 min)
2. Draw a picture of a lamp in your house, draw arrows and pictures going back to where the energy for your house started or was created.
3. Have student groups sort a set of pictures into groups based on how they 'see' energy. Ask them to describe how they sorted their cards into different groups, with a couple of examples for each.

- Have students share how they 'saw' energy with the class. Create a list on the board. Students should end up describing the main types of energy- Chemical, Electrical, Heat/Thermal, Kinetic/Mechanical, Sound, Electromagnetic/light, and possibly gravitational. If they don't have these exact names, name the types and have students use these exact labels in their groupings.
- Have students look at the diagram they drew of the lamp and see if they can label the energy transformations at each step with the types of energy.
- As a class or in groups, discuss that no energy is lost anywhere in the process. The energy that appears to be 'lost' is almost always in the form of heat energy. Have students label heat energy at every transformation point.
- Have students watch this video on electricity generation and transmission.
<https://www.youtube.com/watch?v=20Vb6hLQSG> (5:18 min.)
- Students work in small groups to create a mini-poster showing the path of electricity from coal to light in their house with the energy transformations labeled.



Assessment of Student Learning:

- Describe the difference between the lives of people living in a place without electricity and people living in a place with electricity.
- Name two forms of energy and provide two examples that are commonly seen for each.
- Diagram the flow of electricity from a dam to an oven in a home. Label the energy transformations.

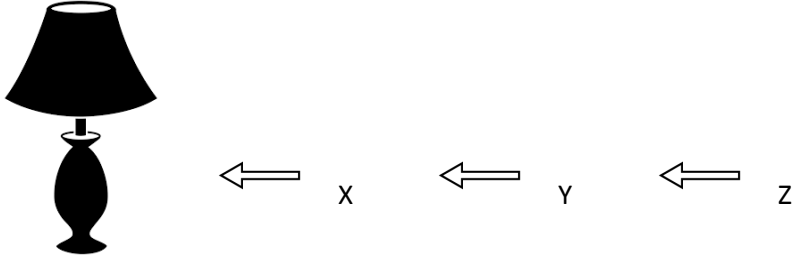
Standardized Test Preparation:

From There to Here- How Energy Moves and Changes

- Which of the following is a transfer of energy?
 - The lighting of a light bulb from electricity
 - The heating of a burner on a gas stove
 - The movement of electricity down a wire.*

- d. The creation of electricity from moving water.

Use the diagram to answer the next questions:



2. Which of the following could be sources for the energy produced at “Z”? Choose all that apply.
- a. Moving water*
 - b. Wind*
 - c. Coal-burning*
 - d. Gravity
3. What happens at point “Y”?
- a. Electricity travels down a wire.
 - b. Electricity is created from the movement of electrons from the energy source.
 - c. A spark creates a chain reaction of energy across a vacuum.
 - d. A device like a turbine transforms the energy into electricity.*
4. What happens at “X”?
- a. Heat travels down a wire and lights the filament in the light bulb.
 - b. Light signals travel along a wire and are released in the light bulb.
 - c. The electricity produced travels through wires to the light bulb*
 - d. Mechanical energy is transformed into electrical energy to turn on the light.

Career Connections:

Lineman - [Job Description](#) [YouTube Lineman](#)

Power Plant Operator - [Job Description](#)

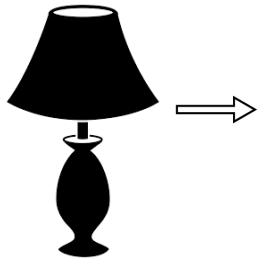
From There to Here- How Energy Moves and Changes

Name _____

Phenomenon: Watch the video clip and focus on how energy is used. What are three questions that you have?

- 1.
- 2.
- 3.

Your life is different. Draw a model of the steps required for electricity to get to you. Start with a lamp in your house and draw arrows and pictures going back to where the energy started.



Use the cards your teacher provides. Sort them into groups based on similarities. Once you have sorted your pictures into groups, write down a brief description of your categories. Write down 2-3 examples from your pictures in the example column.

Description of energy	Examples

Go back to your picture of the lamp and label the energy transformations. Be sure to include energy “lost” as heat.

Watch the video “Energy 101: [Electricity Generation](#)”

Draw another model showing how a lump of coal becomes light from a lamp in your house. Label the energy transformations:



